

WE CLAIM:

- 1 1. A cover for use in a disk drive, the disk drive including the cover, a base, at least one
2 disk mounted to a spindle motor for rotation within the disk drive, and a head stack assembly
3 (HSA) including an actuator assembly pivotally coupled to the base of the disk drive to
4 support at least one head for writing and reading data to and from the at least one disk, the
5 cover for mounting to the base, the cover comprising:
6 a first cover portion having an external side and an internal side; and
7 a second cover portion having an external side and an internal side disposed within
8 the first cover portion, the second cover portion being recessed relative to the first cover
9 portion, the recessed second cover portion being located approximately adjacent to the at
10 least one disk and being substantially coextensive with the at least one disk, the internal side
11 of the recessed second cover portion facing the at least one disk and being closer to the at
12 least one disk than the internal side of the first cover portion.
- 1 2. The cover of claim 1, wherein the recessed second cover portion is substantially
2 circular.
- 1 3. The cover of claim 1, wherein the recessed second cover portion is substantially
2 polygonal.
- 1 4. The cover of claim 1, wherein the internal side of the recessed second cover
2 portion is at a vertical depth sufficient enough to shroud the at least one disk.
- 1 5. The cover of claim 1, wherein the external side of the recessed second cover
2 portion is at least one millimeter vertically distant from the external side of the first cover
3 portion.
- 1 6. The cover of claim 1, wherein the external side of the recessed second cover
2 portion is at least two millimeters vertically distant from the external side of the first cover
3 portion.

1 7. The cover of claim 1, wherein the recessed second cover portion further includes
2 at least one member that projects from the external side of the recessed second cover portion
3 to aid in heat dissipation.

1 8. The cover of claim 7, wherein the at least one member includes an approximately
2 arcuate-shaped member to aid in heat dissipation.

1 9. The cover of claim 7, wherein the at least one member includes an approximately
2 rectangular-shaped member to aid in heat dissipation.

1 10. The cover of claim 7, wherein a plurality of approximately rectangular-shaped
2 members project from the external side of the recessed second cover portion to form a
3 plurality of air-flow channels to aid in heat dissipation.

1 11. The cover of claim 7, wherein the external side of the first cover portion includes
2 at least one channel having at most the same depth as the recessed second cover portion, the
3 channel extending from a side of the cover to the recessed second cover portion, the channel
4 further being disposed within a respective complementary channel-accommodating slot
5 formed within a respective sidewall of the base, such that the at least one member of the
6 recessed second cover portion, through the at least one channel, is in air-flow communication
7 with air flowing about the cover and base to aid in heat dissipation.

1 12. The cover of claim 10, wherein the external side of the first cover portion includes
2 at least one channel having at most the same depth as the recessed second cover portion, the
3 channel extending from a side of the cover to the recessed second cover portion, the channel
4 further being disposed within a respective complementary channel-accommodating slot
5 formed within a respective sidewall of the base, such that the plurality of approximately
6 rectangular-shaped members of the recessed second cover portion, through the at least one
7 channel, is in air-flow communication with air flowing about the cover and base to aid in
8 heat dissipation.

1 13. The cover of claim 1, wherein the base includes a bottom side having a base
2 channel formed therein, the base channel extending from a front end of the base towards a

3 back end of the base and a printed circuit board assembly (PCBA) of the disk drive such that
4 the base channel is in air-flow communication with air flowing about the base from at least
5 the front end of the base to aid in heat dissipation.

1 14. The cover of claim 13, wherein the bottom side of the base further includes at
2 least one side channel extending from a sidewall of the base to the base channel such that the
3 base channel is in air-flow communication with air flowing about the base from at least the
4 front end of the base and at least one of the sides of the base to aid in heat dissipation.

1 15. The cover of claim 7, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is integrally
3 formed with the recessed second cover portion.

1 16. The cover of claim 7, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is attachable to
3 the recessed second cover portion.

1 17. The cover of claim 1, wherein the cover mounted the base to form a housing of
2 the disk drive is compatible with a small form factor standard.

1 18. The cover of claim 17, wherein the small form factor standard is compatible with
2 the Small Form Factor (SFF)-8301 Specification for a Form Factor of 3.5" disk drives.

1 19. A cover for use in a disk drive, the disk drive including the cover, a base, at least one
2 disk mounted to a spindle motor for rotation within the disk drive, and a head stack assembly
3 (HSA) including an actuator assembly pivotally coupled to the base of the disk drive to
4 support at least one head for writing and reading data to and from the at least one disk, the
5 cover for mounting to the base, the cover comprising:

6 a first cover portion having an external side and an internal side; and
7 a second cover portion having an external side and an internal side disposed within
8 the first cover portion, the second cover portion being recessed relative to the first cover
9 portion, the recessed second cover portion being located approximately adjacent to the at
10 least one disk and being substantially coextensive with the at least one disk;

11 wherein the external side of the first cover portion includes a plurality of channels
12 having at most the same depth as the recessed second cover portion, each channel extending
13 from a side of the cover to the recessed second cover portion, each channel further being
14 disposed within a respective complementary channel-accommodating slot formed within a
15 respective sidewall of the base, respectively, wherein at least one of the channels extends
16 from a different side of the cover than one of the other channels to create at least two
17 different channels, such that the second recessed cover portion is in air-flow communication
18 with air flowing about the cover from at least two different sides of the cover through the at
19 least two different channels to aid in heat dissipation.

1 20. The cover of claim 19, wherein the recessed second cover portion is substantially
2 circular.

1 21. The cover of claim 19, wherein the recessed second cover portion is substantially
2 polygonal.

1 22. The cover of claim 19, further comprising a back end channel coupled to one of
2 the at least two different channels, the back end channel further being disposed within a
3 complementary back end channel-accommodating slot formed within a back end sidewall of
4 the base.

1 23. The cover of claim 19, wherein one of the channels extends between different
2 sides of the cover but not through the recessed second cover portion.

1 24. The cover of claim 19, wherein the base includes a bottom side having a base
2 channel formed therein, the base channel extending from a front end of the base towards a
3 back end of the base and a printed circuit board assembly (PCBA) of the disk drive such that
4 the base channel is in air-flow communication with air flowing about the base from at least
5 the front end of the base to aid in heat dissipation.

1 25. The cover of claim 24, wherein the bottom side of the base further includes at
2 least one side channel extending from a sidewall of the base to the base channel such that the
3 base channel is in air-flow communication with air flowing about the base from at least the
4 front end of the base and at least one of the sides of the base to aid in heat dissipation.

1 26. The cover of claim 19, wherein the recessed second cover portion further includes
2 at least one member that projects from the external side of the recessed second cover portion
3 to aid in heat dissipation.

1 27. The cover of claim 26, wherein the at least one member includes an
2 approximately arcuate-shaped member to aid in heat dissipation.

1 28. The cover of claim 26, wherein the at least one member includes an
2 approximately rectangular-shaped member to aid in heat dissipation.

1 29. The cover of claim 26, wherein a plurality of approximately rectangular-shaped
2 members project from the external side of the recessed second cover portion to form a
3 plurality of air-flow channels to aid in heat dissipation.

1 30. The cover of claim 26, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is integrally
3 formed with the recessed second cover portion.

1 31. The cover of claim 26, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is attachable to
3 the recessed second cover portion.

1 32. The cover of claim 19, wherein the cover mounted the base to form a housing of
2 the disk drive is compatible with a small form factor standard.

1 33. The cover of claim 32, wherein the small form factor standard is compatible with
2 the Small Form Factor (SFF)-8301 Specification for a Form Factor of 3.5" disk drives.

1 34. A disk drive comprising:
2 a base;
3 a cover mounted to the base;
4 at least one disk mounted to a spindle motor for rotation within the disk drive; and
5 a head stack assembly (HSA) including an actuator assembly pivotally coupled to the
6 base of the disk drive to support a head gimbal assembly (HGA) having at least one head for
7 writing and reading data to and from the at least one disk;
8 wherein, the cover includes:
9 a first cover portion having an external side and an internal side; and
10 a second cover portion having an external side and an internal side disposed
11 within the first cover portion, the second cover portion being recessed relative to the first
12 cover portion, the recessed second cover portion being located approximately adjacent to the
13 at least one disk and being substantially coextensive with the at least one disk, the internal
14 side of the recessed second cover portion facing the at least one disk and being closer to the
15 at least one disk than the internal side of the first cover portion.

1 35. The disk drive of claim 34, wherein the recessed second cover portion is
2 substantially circular.

1 36. The disk drive of claim 34, wherein the recessed second cover portion is
2 substantially polygonal.

1 37. The disk drive of claim 34, wherein the internal side of the recessed second cover
2 portion is at a vertical depth sufficient enough to shroud the at least one disk.

1 38. The disk drive of claim 34, wherein the external side of the recessed second cover
2 portion is at least one millimeter vertically distant from the external side of the first cover
3 portion.

1 39. The disk drive of claim 34, wherein the external side of the recessed second cover
2 portion is at least two millimeters vertically distant from the external side of the first cover
3 portion.

1 40. The disk drive of claim 34, wherein the recessed second cover portion further
2 includes at least one member that projects from the external side of the recessed second cover
3 portion to aid in heat dissipation.

1 41. The disk drive of claim 40, wherein the at least one member includes an
2 approximately arcuate-shaped member to aid in heat dissipation.

1 42. The disk drive of claim 40, wherein the at least one member includes an
2 approximately rectangular-shaped member to aid in heat dissipation.

1 43. The disk drive of claim 40, wherein a plurality of approximately rectangular-
2 shaped members project from the external side of the recessed second cover portion to form a
3 plurality of air-flow channels to aid in heat dissipation.

1 44. The disk drive of claim 40, wherein the external side of the first cover portion
2 includes at least one channel having at most the same depth as the recessed second cover
3 portion, the channel extending from a side of the cover to the recessed second cover portion,
4 the channel further being disposed within a respective complementary channel-
5 accommodating slot formed within a respective sidewall of the base, such that the at least one
6 member of the recessed second cover portion, through the at least one channel, is in air-flow
7 communication with air flowing about the cover and base to aid in heat dissipation.

1 45. The disk drive of claim 43, wherein the external side of the first cover portion
2 includes at least one channel having at most the same depth as the recessed second cover
3 portion, the channel extending from a side of the cover to the recessed second cover portion,
4 the channel further being disposed within a respective complementary channel-
5 accommodating slot formed within a respective sidewall of the base, such that the plurality of
6 approximately rectangular-shaped members of the recessed second cover portion, through the
7 at least one channel, is in air-flow communication with air flowing about the cover and base
8 to aid in heat dissipation.

1 46. The disk drive of claim 34, wherein the base includes a bottom side having a base
2 channel formed therein, the base channel extending from a front end of the base towards a

3 back end of the base and a printed circuit board assembly (PCBA) of the disk drive such that
4 the base channel is in air-flow communication with air flowing about the base from at least
5 the front end of the base to aid in heat dissipation.

1 47. The disk drive of claim 46, wherein the bottom side of the base further includes at
2 least one side channel extending from a sidewall of the base to the base channel such that the
3 base channel is in air-flow communication with air flowing about the base from at least the
4 front end of the base and at least one of the sides of the base to aid in heat dissipation.

1 48. The disk drive of claim 40, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is integrally
3 formed with the recessed second cover portion.

1 49. The disk drive of claim 40, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is attachable to
3 the recessed second cover portion.

1 50. The disk drive of claim 34, wherein the cover mounted the base to form a housing
2 of the disk drive is compatible with a small form factor standard.

1 51. The disk drive of claim 50, wherein the small form factor standard is compatible
2 with the Small Form Factor (SFF)-8301 Specification for a Form Factor of 3.5" disk drives.

1 52. A disk drive comprising:
2 a base;
3 a cover mounted to the base;
4 at least one disk mounted to a spindle motor for rotation within the disk drive; and
5 a head stack assembly (HSA) including an actuator assembly pivotally coupled to the
6 base of the disk drive to support a head gimbal assembly (HGA) having at least one head for
7 writing and reading data to and from the at least one disk;
8 wherein, the cover includes:
9 a first cover portion having an external side and an internal side; and
10 a second cover portion having an external side and an internal side disposed
11 within the first cover portion, the second cover portion being recessed relative to the first
12 cover portion, the recessed second cover portion being located approximately adjacent to the
13 at least one disk and being substantially coextensive with the at least one disk, wherein the
14 external side of the first cover portion includes a plurality of channels having at most the
15 same depth as the recessed second cover portion, each channel extending from a side of the
16 cover to the recessed second cover portion, each channel further being disposed within a
17 respective complementary channel-accommodating slot formed within a respective sidewall
18 of the base, respectively, wherein at least one of the channels extends from a different side of
19 the cover than one of the other channels to create at least two different channels, such that the
20 second recessed cover portion is in air-flow communication with air flowing about the cover
21 from at least two different sides of the cover through the at least two different channels to aid
22 in heat dissipation.

1 53. The disk drive of claim 52, wherein the recessed second cover portion is
2 substantially circular.

1 54. The disk drive of claim 52, wherein the recessed second cover portion is
2 substantially polygonal.

1 55. The disk drive of claim 52, further comprising a back end channel coupled to one
2 of the at least two different channels, the back end channel further being disposed within a

3 complementary back end channel-accommodating slot formed within a back end sidewall of
4 the base.

1 56. The disk drive of claim 52, wherein one of the channels extends between different
2 sides of the cover but not through the recessed second cover portion.

1 57. The disk drive of claim 52, wherein the base includes a bottom side having a base
2 channel formed therein, the base channel extending from a front end of the base towards a
3 back end of the base and a printed circuit board assembly (PCBA) of the disk drive such that
4 the base channel is in air-flow communication with air flowing about the base from at least
5 the front end of the base to aid in heat dissipation.

1 58. The disk drive of claim 57, wherein the bottom side of the base further includes at
2 least one side channel extending from a sidewall of the base to the base channel such that the
3 base channel is in air-flow communication with air flowing about the base from at least the
4 front end of the base and at least one of the sides of the base to aid in heat dissipation.

1 59. The disk drive of claim 52, wherein the recessed second cover portion further
2 includes at least one member that projects from the external side of the recessed second cover
3 portion to aid in heat dissipation.

1 60. The disk drive of claim 59, wherein the at least one member includes an
2 approximately arcuate-shaped member to aid in heat dissipation.

1 61. The disk drive of claim 59, wherein the at least one member includes an
2 approximately rectangular-shaped member to aid in heat dissipation.

1 62. The disk drive of claim 59, wherein a plurality of approximately rectangular-
2 shaped members project from the external side of the recessed second cover portion to form a
3 plurality of air-flow channels to aid in heat dissipation.

1 63. The disk drive of claim 59, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is integrally
3 formed with the recessed second cover portion.

1 64. The disk drive of claim 59, wherein the at least one member that projects from the
2 external side of the recessed second cover portion to aid in heat dissipation is attachable to
3 the recessed second cover portion.

1 65. The disk drive of claim 52, wherein the cover mounted the base to form a housing
2 of the disk drive is compatible with a small form factor standard.

1 66. The disk drive of claim 65, wherein the small form factor standard is
2 compatible with the Small Form Factor (SFF)-8301 Specification for a Form Factor of
3 3.5" disk drives.